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Chapter 2

GOALS IN TEACHING RESEARCH METHODS TO ADMINISTRATORS?

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Charles Schultze, a man with considerable administrative and political experience as former director of the Bureau of the Budget and chairman of the Council of Economic Advisers, writes, "The most frustrating aspect of public life is . . . the endless hours spent on policy discussions in which the irrelevant issues have not been separated from the relevant, in which ascertainable facts and relationships have not been investigated but are the subject of heated debate, in which consideration of alternatives is impossible because only one proposal has been developed, and, above all, discussions in which nobility of aim is presumed to determine the effectiveness of the program." (Schultze, 1968, p. 75). Investigating facts and relationships? Separating the relevant from the irrelevant? Systematically considering alternatives? Finally, determining the effectiveness of programs? Aren't we teaching research methods to public administrators in the hopes of increasing these activities in the decision-making process?

I would argue that we are teaching research methods and statistics to public administrators to motivate them to seek research and use its results as an important guide to their actions and decisions. By "seek research" I mean for our students to view research as an important source of knowledge. I want to instill in them the desire to learn the "the facts and relationships" as they began a new

venture. Thus, when a new project begins or a problem is recognized, they will turn to existing research to learn of theories and empirical research on the nature of the problem and its relationships to other variables; the successes and failure of similar programs in other towns, cities, or states; the nature and success of alternative interventions; and case studies of the implementation of similar programs with similar populations. Our students will understand the potential utility of each of these different types of research to their examination of the problem and development of policy. If appropriate, they may initiate or direct original research to learn more about the problem in their own setting. As the program begins, they will collect "data" or information on its implementation comparing that implementation with the model to learn more about the problems actually confronted in the field and the adaptations that are made. Finally, when considering the effectiveness of the program, they will not be afraid of failure or become blind advocates for their solution, but instead will be *curious* about the success of the program in achieving its goal and want to learn of its good and bad side effects.

Our former students will consider research methods as an important way to test the program. Of course, the actions of a particular alumnus will differ with his or her position. One of our alumni is the Mayor of the City of Colorado Springs. As a policy-maker, her use of research would occur in requesting data from city employees or contractors on the importance of various problems, the feasibility of proposed alternatives, and the success of completed ventures. Another of our alumni is the head of the SWAT team with the local police department. He would be more interested in data on the process of implementation, i.e., are his new initiatives being carried out in the field? To what immediate effect? Finally, both, as professional public administrators would keep informed on research advances in their respective areas of expertise, city governance, criminal emergency management. If they are motivated in these ways, certainly we have succeeded.

Having succeeded in these affective goals, we then want our graduates to be able to understand the research they receive. They should be able to determine if appropriate methods were used to answer the stated questions or hypotheses. To the extent possible, they should use it dispassionately; that is, they should be conscious of their own biases in regard to this research and consider how these biases affect their consideration of the research. Finally, in the frequent case where existing research conducted in other settings is used as the information source, our students will be able to consider the extent to which the results are relevant for their own organization. We want them to be informed, and critical, consumers.

Finally, our most important goal is to help our students become better thinkers. At this risk of criticism in this post-positivist era, I'd like to quote Robert Pearson who developed the correlation statistic, the Pearson r. He wrote, "What distinguishes a scientist from non-scientist is not subject matter but habit of mind." We are trying to teach our students a "habit of mind." What is that habit of mind? While I would be among the first to argue that public administration is not, and should not be, a science, we can learn from the tenets of the scientific method. That scientific method can include collection of information from a wide variety of sources in a wide variety of ways - case studies, qualitative and quantitative data, natural as well as laboratory experiments, etc. But, all of these methods of data collection can draw on the scientific method for these two habits of mind: (a) suspension of judgment, and (b) the systematic collection of information (data) on the thing to be judged or the decision to be made. To the extent possible, we want our graduates to avoid making hasty judgments based on limited information. They should be alert to information which points to different directions. We want them to seek information, not just to confirm their predispositions, but to explore, to be open to new interpretations, options, avenues. The information collected can range from observations of staff comments during coffee breaks to carefully-constructed outcome measures of clients. However, the analysis of the information is systematic. Students will consider each source, its strengths and weaknesses, its results, and combine them to reach some decision or make some judgment. These methods can be applied to tasks ranging from hiring a new staff member (reviewing resumes and letters, considering information gaps and biases of sources, developing interview questions and considering responses, etc.) to deciding whether to continue a funded program. With each, our students suspend their judgment, collect information from a variety of sources with differing biases to offset the bias of each, compare and synthesize the results of these sources, form a judgment, and make a decision.

But, becoming better thinkers involves more than suspending judgment and collecting information to inform that judgment. Research methods should assist them in separating the relevant from the irrelevant. Learning about models, variables, and relationships should enable our students to think about problems in better ways. Our courses should aid them in conceptualizing problems and building programs or developing policies to address those problems. During program development stages, our graduates should be developing clear, logical models of program theory and delineating inputs, actions, and outcomes, and the connections between each. They should then go on to use these models as the foundation for better program implementation and evaluation.

In summary, our primary goals are broad. We want to improve the nature of decision-making. To do so, we want to inspire students to use research, to be capable consumers of it, and to use critical thinking skills in developing and managing programs.

Our Methods for Teaching Research

Now, we need to apply these skills to our own work. What methods do we use to attempt to achieve these goals? And, how well do we succeed? Given the need for brevity, I will skirt the success question. Suffice it to say, we could improve.

While the use of data to inform decision-making may have increased since the years of George Schultze, too often our officials mandate evaluation or data collection, but fail to use it. On many important issues, *especially* on important issues, research does not serve as source of information. Opinions have already been formed. The research on the use of information in political decision-making is vast, but I will argue that we, as teachers of public administration, need to better explore how, and if, our efforts have made an impact. Leanna Holmer and Guy Adams have written of what they call "the practice gap" in organizational theory and management skills. They write, "The *practice gap* is the difference between what individuals (as managers, employees, or students) *know* and *advocate* as theoretically good practice for given organizational situations, and what they actually *do* in those situations." (Holmer & Adams, 1995, p. 4). We have a similar practice gap in research methods. Our graduates may know about research methods and even advocate their use, but rarely do they initiate or use research themselves. We have failed to achieve our affective, or motivational, goals.

Recognizing that, in any case, our efforts could be improved, let us consider our methods. How do we attempt to achieve the affective goal of inspiring our students to use research? to become better critical thinkers? Far too often through mind-numbing hand calculation of statistics. Or, extended discussions of threats to internal validity, sampling theory, etc. without relating these issues to real research. One barrier is the texts themselves. While many methods and statistics texts have become more readable over the years and application is discussed more frequently, texts remain a barrier. Research methods and statistics are complex and new to most of our students. Texts are, by their very nature, wordy. They don't lend themselves to practice, but to explanation. Thus, we lecture and explain. Class time spent on lecture and explanation limits our time for practice. Often, because we understand the information presented in the text and, in fact,

enjoy it, we spend our class time discussing the arcane issues that we, as researchers, struggle with. We forget that their use of our content will be different than ours. We begin to train them to be like us.

Alternative Methods

I began teaching statistics and research methods as I was taught, often by people intrigued with the subjects themselves and not so concerned with their application in the real world. My change in teaching methods began with a change in fields. I had been teaching statistics and research methods to graduate students just out of undergraduate school who were going to pursue Ph.D.'s or become applied researchers in organizations. A new position called in public administration. Though my Ph.D. was in psychology, my bachelors and masters degrees were in political science. I had moved to psychology to pursue the inter-disciplinary field of program evaluation with the goal of improving the management of public sector programs through information. Though the move was delightful (I never felt at home in psychology), I was now faced with teaching MPA students. They were quite different. Unlike the psychology graduate students who hung out doing research at the department, my MPA students were employed adults. They were older and had considerable work experience. Most importantly, their goals were not to be researchers, but to become managers and policy-makers. Many were already in such positions and wanted to hone their skills, not only for future advancement, but for their present positions. As a practicing evaluator, I had to consider what my goals were with these students. These students were not going to be *doing* research as much as *requesting* and *using* research. Thus, I began the evolution to the goals stated above.

Educating students to be consumers of research. To achieve my goals required a change in my methods. How could I teach my students to be consumers of research? The answer seemed obvious - by having them "consume" research. I had been taught research methods in isolation. We read the methods text and practiced the methods. We may have read small case studies in the text that illustrated the use of the research. But, we did not read articles and technical reports to explore the use of method. Our exposure to research articles was in other "content" classes where we read research for its content, not to focus on method.

So, I began having students read and critique published research. With each method we read about in our text, I found research or technical reports which used that method. (This sometimes was not easy as searches are not organized by method. Try finding a journal article that actually used random sampling from the population of interest! It changes your opinion about sampling and practice.) We then read these articles or reports and were able to see these methods in practice. More importantly, we practiced *reading* research. To my surprise, students often had trouble interpreting even the review of literature of an article.[1] They struggled with articulating the purpose. Their skill in interpreting results was, of course, even shakier. But, the whole language of research intimidated many of them. I continued having them practice, but began using newspaper articles and pieces from the popular press as well. To build their critical thinking skills and help them become better consumers, I would probe them on what more they would like to know from these popular articles. What would they ask the researcher if she were present? For each article, I asked them to summarize what the researcher had learned, whether the methods were appropriate for the purpose, and how they would generalize what had been learned to their settings. From this practice on each new subject we learned, developing hypotheses, sampling strategies, data collection, and analyses, they gained skills in interpreting and using research.

Identifying applications of research to their work. One of the skills I found most wanting among the students was simply identifying questions or issues in their work setting that research could help them answer. When you do not know something, you do not know what it can do. Their inexperience with research hindered their ability to identify work issues which might be assisted by research. As a result, I spend more and more class time having them develop research questions and apply them to their work setting. We not only generate questions or hypotheses research could test, but we consider which designs could be used and how they would be implemented, how samples could be drawn (or, if they need to be drawn), and how data could be collected. At the beginning of each class, one or two students present a research question from their work and we discuss how we would conduct research in their setting to address that question.

[1] I now have students practice analyzing how the researcher builds her argument for her research. Students address these questions: How did she organize her review? Did she move from theory to empirical research? How did she use each citation? What else might she have looked for in the literature? How else might she have made a case for the need for her research? What sources of knowledge did she use?

Depth or Breadth? As in all MPA programs, the number of research methods courses we offer is limited. Thus, we face a choice between breadth, covering many different research topics, and depth, developing excitement and feelings of competence and skill in more limited areas. The more I teach, the fewer topics I teach; my move has been toward greater depth on fewer topics. Reflecting on my objectives, I realized that if I am to succeed in motivating students to use research, I must not only help them see how it can be used, but excite them about it. To achieve this excitement requires depth. Probing into one area, not only gives them competence and, hence, confidence in that area, but makes them excited about the potential for research in many other areas. If we are attempting to create life-long learners, we can hope that the expertise we give students in one area and the enthusiasm achieved, will translate to learning in other areas in the future through workshops and individual, self-motivated learning.

Finally, I realized that critical thinking skills are built by practice with many different problems, not by an introduction to the definitions, terms, and steps of many research methods. (The latter becomes recipe-like with insufficient time.) Specifically, I focus on developing critical thinking skills with three areas: model-building for generating hypotheses and research questions, selecting and implementing designs, and interpreting statistics. We practice extensively with each of these. Students practice developing and critiquing models, developing alternative models to solve the same problem, comparing the models, and finding literature to support or reject a model. Through this practice, they learn to question common assumptions, to delineate the relevant from the irrelevant, and to identify new approaches and compare them with others.

We practice selecting the appropriate research design for hypotheses or research questions we have developed and justifying that selection. Data collection skills are practiced by considering all the different sources and methods for collecting information to answer a specific question or to measure a specific construct. We reflect on the different results each source and method might give and the biases inherent in each. Finally, in statistics, we focus more on the interpretation of the findings. I encourage students to examine the tables or graphs in an article and make their own interpretations *before* reading the author's interpretations. Then, they examine whether their interpretations are congruent with the authors'. I use several examples from popular literature where the narrative report leads the reader to focus on issues other than the main ones seen in the table or graph. With articles containing mixed results, I assign students to teams to argue each side. (This is most useful when the author emphasizes one interpretation, but the data available suggest alternatives.) When analyzing data, students cannot simply present the data; they must write an interpretation of that

data. They then contrast their interpretations with others. Using a health data base with variables for cigarette smoking and heart disease among many others, I assign student groups to analyze the data for the American Lung Association or the tobacco lobby. Students must find in the vast data base results to support their organization's point of view. Such exercises pique their curiosity and hone their critical thinking skills as well as making them familiar with various statistical techniques.

A Special Word about Statistics

Remember learning statistics before computers? Or with key-punched cards? Then, much of our time was spent in tedious hand calculation. We could examine relatively few relationships because each calculation was so time-consuming. As computers became more available, we spent as much time instructing students in using SPSS or SAS as in teaching statistics. Today, we are blessed with user-friendly statistical software that allows us to get our students into statistics right away. Our students have opportunities to examine many relationships among variable in one class period! This ease presents opportunities and challenges, but, I would argue, the opportunities are more abundant than the challenges.[2] Unfortunately, too many statistics professors still burden their students with many tedious hand-calculation and theories. When these students graduate to my classes, I learn they do not have the big picture. They are doing statistics mechanically. They do not know how to thoroughly describe and explore relationships.

My goals in regard to statistics are these: (1) Students will feel comfortable dealing with data. While our students' computer skills are increasing by leaps and bounds, many are still intimidated by statistics. (2) Given a table or results of an analysis, students will be able to interpret them and discuss their implications. To most managers, statistics are meaningless without interpretation. And, different people will draw different interpretations from the same data. Through working on reporting and interpreting results, students will recognize the nuances and values that influence interpretation and will develop their skills, as future consumers, in using statistics. (3) Given a problem, students will be able to select the appropriate statistic to answer the problem. I find that many students, even

[2] The primary challenge is keeping students from continuing to simply "play" with the data, in an unending, blind search for relationships. The ease of analysis makes this tempting. While I began with "playing" with data, to introduce students to the subject, we move to focusing our search on answering specified questions or hypotheses.

those who have had significant statistical background, do not know which test to use unless they know which chapter they are at the end of! In the real world, we don't know what chapter we're at the end of. Students can refer back to their statistics books to refresh themselves on chi squares or regression, but if they don't know which test to use (or which test should have been used in a report they are reading), their old texts are of no help.

How have I adapted my methods to achieve these goals? User-friendly software (I use MicroCase, but Minitab is another good product) has helped enormously. My students began using the computer in the first class. I describe the real-life data bases (one on crime rates and demographic characteristics in states and one on people's political attitudes and demographics), and we brain-storm hypotheses. How many people do you think like classical music? Do you think classical music lovers voted for Clinton or Dole? Then, we immediate check out our hypotheses with the data. I demonstrate first using my computer and overhead. They then practice testing hypotheses in two-person teams around their computers. They develop a few bar charts and pie charts to see the variables or they use the mapping capability of MicroCase on states to see the distribution of violent juvenile crime across the country. Getting the students onto the computer, "fooling with data", right away does a lot to establish their confidence and dispel their anxieties. Moreover, it gets them interested. The subject matter piques their curiosity.

The first class is crucial. Eleanor Willemsen (1995) has written about the importance of establishing an "I-can-do-it" attitude in that first class. Students enter any classroom with a set of expectations which have evolved from their prior experiences in classrooms and with that subject matter. Few students come to public administration because of the research and statistics. They are interested in politics or management. As I say to my students, when you tell people that you teach statistics, no one says, "Oh, that was my favorite course!" For many, their reaction is quite the opposite.[3] Our students, many of whom are returning students who have not had a mathematics-oriented course in years, come to our classes with great trepidation. Their experiences in previous math courses have not been positive ones. Even if they were successful, they did not enjoy it. If we are to succeed in making them into managers who use research actively in decision-

[3] One of my husband's colleagues, after meeting me, remarked to him that I had quite a sense of humor. He was surprised because that was not his vision of a statistics professor. Such are our reputations!

making, we must first make them comfortable. I find getting them involved with exploring data on the computer during the first class helps ease that transition.

We can build an "I-can-do-it" attitude by giving them an expectation of eventual success. If, in the very first class, they can learn to look at a variable and see what it is (how people respond, the central tendency, the variability) and its relationship to another variable (I do this visually using the mapping capability to comparing the states on two different variables), they see that they have been able to take the first step. Further, the students see that statistics can be interesting and fun. (Did you know that burglary rates are related to votes for Ross Perot? Of course, this finding moves us into discussions of causality.) Since the data bases are real, the students begin to feel like real researchers. Willemsen talks about engaging students by making them "a part of the community of people who can do mathematics, statistics, chemistry or whatever the subject is." Rather than presenting statistics as a remote, mysterious world of numbers, we engage them with data that are familiar and interesting and, with these, help them to learn what statisticians do - describe attitudes and behaviors and examine relationships.

We use the computer in every class to demonstrate and practice what we are learning. This use has led to other changes. While I do have students hand-calculate one or two problems and I demonstrate the calculation once in class, my emphasis is on why putting numbers together in this way tells us something. With the exception of these hand-calculations (which I don't continue beyond chi square and t-tests), my students do not work with calculators. I also have greatly reduced the amount of class time I spend on proofs or theory. Instead, my students work as you and I work. They use statistics software to describe people and states and examine relationships between variables. Their challenge is specifying the question or hypothesis, identifying the variables and describing them, testing relationships with appropriate tests, and interpreting those results. Their interpretations are both written and oral, but they must be comprehensible to the typical manager. Their interpretations must explore the real meaning of the data and its implications. Typical homework assignments require them to write executive summaries or memos describing what they have found. Tables or graphs may be attached to illustrate or summarize trends, but their narrative is the heart of the interpretation as it will be when reports are read by policy-makers and managers. (Don't they skip the results section, too?)

Having been exposed too frequently to statisticians who cannot really describe their data set and the relationships therein or who, in their rush to sophisticated or recipe-like analyses, have failed to examine descriptive statistics on each variable and gain a true understanding of their numbers, I want to teach students to think, to view data analysis as a process, not an end product with only

one correct answer. Rather, examining the data - relentlessly - will help them learn many details. The learning is like the layers of an onion. Each analysis (of sub-groups, of different measures of the variable, maintaining continuous variables versus collapsing into discrete categories) tells us something more about the relationship. Because students relate statistics to math, they too often think there is only one correct answer. Ironically, my more mathematically-inclined students (civil engineers, environmental analysts) struggle more with this concept, the legitimacy of differing interpretations, than do students from the humanities and fine arts. Statistics are painting a picture for us. While there is obviously only one correct mean or one way to calculate a t-test, there are many ways to describe a variable and examine its relationship to another. Each of these ways tells us more. We must engage students in this process.

Williamsen (1995) presents many suggestions for helping students in statistics develop what she calls positive "metacognitions," or ways to talk to yourself about statistics. She notes their typical metacognitions on entering a class are "I can't understand this." "This is terrible; I'll never be able to do this." The anxiety reflected by such thoughts hinders learning. Instead, we must help students see that while the content is new and the ways of thinking are different, they can eventually succeed. We must help them see that "effort, not talent, as the road to learning (Williamsen, 1995, p. 17)." This statement may seem extreme, but, in fact, any student who is in a graduate school has the "talent" to do regression. (I realized this recently when my son's eighth grade math class began using Excel to do regression. They called it examining slopes and lines, but it was regression.) It is helpful to students to recognize that effort and practice, not some special mathematical gene, are all that are needed for them to master this content.

Williamsen points out that students who have been successful at math know what methods they need to use to learn. When confronted with new, confusing concepts or "scary" numbers, their positive metacognitions are likely to be something like: "I need to do lots of example problems before I get it." Or, "It always helps me to start with a list of what I know and what I need to solve for." Or, "The best approach for me is to have my friend show me the steps she used." (Williamsen, 1995, p. 19). I encourage my students to work in teams. Often a student who has just discovered the concept can understand another student's possible confusions better than we who have known the concept for years.

But, we should not rely on peers to do all the teaching. I try to use different ways to present the concept, recognizing that some students will learn with one type of explanation, others by another. Thus, I introduce variability by contrasting the weather in Albany, New York and Denver, Colorado (both of which have the same mean, monthly winter temperatures, but very different highs and lows).

Since many Colorado residents have migrated from the northeast, they relate to the days where the low was 30 and the high was 34. I contrast that with Colorado where the low was 12 (in the middle of the night) and the high 52. Then, I ask how important is it to know variability. Averages don't convey the differences in weather in Albany and Denver. Measures of variability do. But, I then move to having us "develop" a way to measure variability. What is variability? Distances of scores from the mean? What about calculating the average distance of scores from the mean? But, we get 0 because the minuses and pluses cancel each other out. What if we square the numbers to get rid of the minuses, then unsquare the end product? Yes, now we have standard deviations. Using stories, intuition, and, finally, numerical calculations, I hope to engage each student in an understanding of variability.

Finally, I encourage them to analyze their own thinking about statistics. While I avoid the jargon of "metacognitions," I ask them to reflect on their experiences and how they learn best. As they develop confidence in statistics, I ask them to consider how their attitudes about their skills are changing. Some students are astonished to find that they enjoy the course and that they have skills and talents they were unaware of. I don't, of course, succeed with all!

CONCLUSION

There are many barriers to teaching statistics and research methods to administrators or future administrators. Among the primary ones are that we were never taught to teach. We were taught the subject matter, but not the methods. Thus, we often continue to teach in the manner in which we were taught. Faculty rarely, if ever, observe others teaching. So, we fail to learn new methods or reflect on our own. My own change was precipitated by a change in my students (from those who would be researchers to those who would be managers) which caused me to reflect on my goals. My changes then came about from my training and experience in program evaluation - to reflect on the link between goals and objectives and processes. As I recognized that my teaching activities were not structured to lead to the outcomes I desired in my students, I began to adapt. The process has been fascinating and fun, but I continue to adapt and test. I hope to model what I am teaching my students, to model questioning, curiosity, and exploration.

A major barrier that I struggle with continues to be texts and format. To achieve our goals requires practice. But, the books lead us away from practice and into explanation, many times of things our students do not need to know or

certainly do not need to know in beginning courses. I feel embarrassed to assign much less reading than my colleagues who teach other courses. (They will wonder what I am doing! They will question my scholarliness and intelligence!) My students expect reading. (They bemoan the cost, but they want books. They want structure. Their "metacognitions" about graduate education tell them we must read and struggle.) So, the tail wags the dog. In this time of change in higher education, we need to experiment in our teaching, to reflect on our goals, and to consider the appropriate means for achieving them.

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